MICRO CASE 76 --- viridians streptococci (native valve endocarditis)

A 62-year old man was seen in his family physician’s office for complaints of low-grade **fevers, night sweats, and fatigue for 3 weeks.**

The patient had a **history of a heart murmur** but had never undergone extensive evaluation. He had been in generally excellent health with normal exercise tolerance. Approximately 6 weeks ago he underwent an uncomplicated **extraction of an impacted wisdom tooth** but received **no antibiotics** prior to the procedure.

* PHYSICAL EXAM:
  + A “**splinter hemorrhage” in the nail of his right index finger**
  + **Conjunctival petechiae**
  + Enlarged spleen
  + \*\* **JANEWAY LESIONS** (small erythamatous lesions on palms or soles)
  + **Osler nodes** (painful raised lesions on finger and toe pads)
  + **Roth spots** (retinal lesions)
* DIAGNOSTIC WORK UP
  + **Echocardiography** (echo) 🡪 transesophageal more sensitive.
  + **Blood cultures**
  + **Serology** for non-cultivable agents
* DIFFERENTIAL:
  + Potential causes of endocarditis 🡪 S. aureus, viridians streptocci, S. epidermidis, enterococci, and S. pneumoniae are commonly encountered
* Source = viridians streptococci (native valve endocarditis)
* MICROBIOLOGICAL PROPERTIES
  + **Many species exist as commensals (human oral flora and GI tract)**
    - Enter bloodstream following dental procedure or vigorous tooth brushing
  + **MULTIPLE BLOOD CULTURES are necessary to demonstrate continuous bacteremia in IE (infective endocarditis)**
* MANNER OF EXPOSURE
  + Infective endocarditis usually occurs as a result of transient bacteremia in the setting of a **PRE-EXISTENT valve abnormality.**
  + IE can be divided into two categories:
    - (1) **ACUTE BACTERIAL ENDOCARDITIS** 
      * Usually caused by S. aureus (esp in patients with I.V. drug use)
      * Can also be caused by S. pyogenes and Streptococcus pneumoniae
      * Pathology: LARGE vegetations and abscesses. Fulminant coarse.
    - (2) **SUBACUTE BACTERIAL ENDOCARDITIS (SBE)**
      * Pathology: smaller vegetations and more indolent coarse
      * Further divided into:
        + (a) **Native valve endocarditis**

often caused by viridian streptococci, enterococci, or HACEK (Haemophilus, Actinobacillus, Cardiobacterium, Eikenella, and Kingella)

sequela of dental procedures

* + - * + (b**) Prosthetic valve endocarditi**s

Often caused by staphylococcus epidermidis

* PATHOGENESIS
  + Native Valve Endocarditis Pathogensis:
    - First, generally must have (1) Abnormal valves or (2) **turbulence to the endothelial surface of the heart**, leading to minor trauma. This can lead to deposition of fibrin and platelets, so-called non-bacterial thrombotic endocarditis (NBTE). Transient bacteremia then leads to **seeding of lesions with adherent bacteria** (In viridian streptococci, fibronectin-binding proteins facilitate adherence to thrombi whereas in S. aureus, surface clumping factors facilitate adherence to intact endothelium or exposed subendothelial tissue.) Organisms become entrapped in the growing platelet-fibrin vegetation and proliferate, forming microcolonies. Pathology in other organs is a result of deposition of circulating immune complexes to deposited bacterial Ags.
  + Those with **IVDU, predominantly have a right-sided disease, caused by S. aureus and involving the tricuspid valve** (may cause pulmonary septic emboli or just SBE type effects)
  + May produce:
    - Elevated ESR
    - Anemia
* TREATMENT
  + **4-8 weeks of I.V. Antibiotic (Antiobiotic choice dependent on susceptibility test of blood isolate)**
  + usually for viridians streptococci, pen G with or without aminoglycosides sufficient
* PREVENTION
  + Give prophylaxis treatment for those in high risk groups (ie. Already have a heart issue) receiving dental procedures, GI endoscopy with biopsy, and urologic procedures.